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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/786,960	03/12/2001	John A. Howard	10015	8289

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EXAMINER
IBRAHIM, MEDINA AHMED

ART UNIT	PAPER NUMBER
1638	14

DATE MAILED: 01/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/786,960	HOWARD ET AL.	
	Examiner	Art Unit	
	Medina A Ibrahim	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 October 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4 and 5* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I in Paper No. 12 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). The restriction is made FINAL.

Claims 27-31 have been cancelled. Therefore, claims 1-26 are pending and are under examination.

Sequence Listing

Applicant's CRF and paper sequence listing have been entered.

Drawings

The drawings filed in this application are approved by the Examiner.

Specification

This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

Claim Objections

Claims 1-26 are objected to because of the following informalities: Claim number (i.e., Claim 1, Claim 2, etc) should not be separated from the text of the claim.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 15, "linked" does not define an operable linkage. It is suggested that ---operably--- be inserted before "linked". Also, "to effect expression" in claim 1 should be changed to ---- which controls expression---, for proper promoter function. In claim 15, is production level of 0.01% considered to be commercial quantity? Dependent claims 2-14 and 16-24 are included in the rejection.

In claims 7-8, what are the "fungal laccase-producing nucleotide sequence" and "*Trametes versicolor* laccase-producing nucleotide sequence", respectively? In addition, it is unclear if the claims are intended to further limit the laccase of claim 1 or to include another laccase.

In claims 9 and 11, "the nucleotide sequence producing laccase" lacks antecedent basis. It is suggested that "producing" be replaced with ---encoding---.

Claim 11 is indefinite for failing to recite the specific hybridization conditions required for "stringent". While clarification is required new matter should be avoided.

In claims 16 and 17, ---further--- should be inserted before "comprising".

In claims 12 and 19, "the globulin promoter" implies that there is only one globulin promoter. It is unclear if there is only one globulin promoter.

Claims 20-21 are confusing as it is unclear whether the claims are intended to recite an additional method step or add additional feature in the construct. Also, "fungal

laccase-producing nucleotide sequence" and "*Trametes versicolor* laccase-producing nucleotide sequence", respectively are unclear.

In claim 22, "introducing a construct -----" into what?

Claim 24 is indefinite for failing to recite the specific hybridization conditions required for "stringent". Also, "laccase-producing sequence" is unclear.

Claim 25 is indefinite as it is unclear how commercial quantities of laccase are produced? The steps are unclear. Also, it is unclear what is considered to be "commercial quantities". Also, "to effect" should be replaced with --- which controls ---, since promoters control and not effect expression. Dependent claim 26 is included in the rejection.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 13-14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to a non-statutory subject matter. The claims do not read, "transformed". The seed and the plant cells may not contain the transgene of the parent plant. Due to chimerism, not all of the cells from a transgenic plant will comprise in their genome the transgene. If the seed (claim 13) and the plant cells (claim 14) do not contain the transgene, then the claims will read on the product of nature. This does not appear to be Applicants' intention. It is suggested that the claims are amended to read --- Transformed seed---, and ---Transformed plant cells---, respectively.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-26 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method for producing laccase in plants at levels of not more than 0.1% of the total soluble protein in maize by expressing the isolated nucleotide sequence of SEQ ID NO: 1 under the control of the maize globulin promoter and the barley amylase signal sequence, and transgenic plants and seed comprising said construct, does not reasonably provide enablement for a method for producing laccase in commercial quantities or at levels of about 1% or 10% or higher of the total soluble protein of the plant or a method that employs any fungal laccase-producing nucleotide sequence or any nucleotide sequence having at least 68%-100% and 80% to 100% to SEQ ID NO:1 and nucleotide sequences that hybridize to SEQ ID NO:1 under stringent conditions. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claims are drawn to a transgenic plant comprising a nucleotide encoding laccase from any source, including those from fungi and nucleotide sequences having at least 68%-100% and 80% to 100% sequence identity to SEQ ID NO: 1 or sequences that hybridize thereto under stringent conditions, operably linked to a promoter which directs expression of laccase, wherein the laccase is produced at levels of about .01%,

0.1%, 1% and 10% or higher of the total soluble protein of the plant. The claims are also drawn to a method of producing laccase in commercial quantities by introducing a construct comprising a nucleotide sequence encoding laccase, including nucleotide sequences having at least 68% to 100% and 80% to 100% sequence identity to SEQ ID NO: 1 under the control of the globulin promoter, a signal sequence and target sequence directing the expression of laccase into the plant cell, ER and to the seed of the plant.

Applicant teaches maize plants stably transformed with a construct (p7017 p7718) comprising laccase DNA from *Tramets versicolor* or SEQ ID NO: 1, operably linked to the barley amylase signal sequence and the maize globulin promoter, wherein the highest levels of laccase produced was only at 0.1% of the total soluble protein for plants transformed with p7718 and 0.01% for the plants transformed with p7017 (Example 4).

Applicant has not provided guidance for how to achieve expression levels of laccase of 1% and 10% of the total soluble protein of the plant using exemplified or non-exemplified laccase encoding nucleotide sequences. No specific guidance has been provided for the obtention and use of other laccase encoding DNAs including those from other fungi and nucleotide sequences having at least 68%, 80% sequence identity to SEQ ID NO: 1 and nucleotide sequences that hybridize thereto under undefined stringent conditions. No specific plant expression systems (specific promoters, signal and target sequences) for said nucleotide sequences, which would allow expression of laccase at commercial levels, have been disclosed. Applicant has not provided

evidence that any and all nucleotide sequences having 68% and 80% sequence identity to SEQ ID NO: 1 would encode a functional laccase. Further, the claimed 68% and 80% sequences include those obtainable by numerous modifications such as additions, deletions and substitutions of one or more bases in SEQ ID NO: 1. However, Applicant has not provided guidance as to where and how such modifications can be applied so that the laccase activity is retained. With respect to hybridizing sequences, Applicant has not provided guidance for primers, hybridization and wash conditions specific for laccase which would allow one skilled in the art to obtain those nucleotide sequence that encode laccase. In addition, Applicant has not provided guidance for the suitability of plants other than maize for the production of recombinant and functional laccases in commercial quantities.

The state of the art teaches unpredictability inherent in the production of foreign proteins that are functional in transgenic plants or plant parts. For example Becker et al (Ann. Proc. Cytochem Soc. Of Europe, pp. 325-331, 1993) teach stable accumulation of recombinant human plasminogen activator (tPA) in mature transgenic tobacco seed, however, assays for testing tPA protein activity failed to reveal active tPA protein (see at least page 327, Results). The state of the art also teaches that not all nucleotide sequences that hybridize to each other or share high sequence identity encode proteins having identical function. For example, Lazar et al (Molecular and Cellular Biology, March 1988, Vol. 8, No. 3, pp. 1247-1257 (U)) proteins that differ in a single amino acid and still are different in biological activities (see at least the Title). Broun et al (Science, 13 November 1998, vol. 282, pp. 131-133 (U)) teach that as few as four amino acid

substitutions in a protein can change the protein activity from oleate 12-desaturase to a hydroxylase (Abstract). Examiner notes that the nucleic acid sequences encoding the proteins (mutant and original) disclosed by either Lazar or Broun would share much more than 68% and 80% sequence identity and would hybridize to each other under any stringent conditions.

In addition, the working example disclosed in the specification is limited to the use of SEQ ID NO: 1 in maize and production level of not more than 0.1% of laccase.

Because Applicant has not provided guidance for how to obtain nucleotide sequences other than SEQ ID NO: 1 or their ability to encode functional laccases when expressed in transgenic plants or plant parts, and no specific plant expression system have been disclosed for sequences other than SEQ ID NO: 1, one skilled of ordinary skill in the art is left with trial and error experimentation not considered to be routine, to use nucleotide sequences having at least 68% and 80% sequence identity to SEQ ID NO:1 and those that hybridize thereto under undefined stringent conditions for the production of functional laccases in plants or plant parts at levels of at least 0.01%, 0.1%, 1%, and 10% of the total soluble protein, much less in commercial quantities.

Therefore, in view of the broad scope of the claims, the limited guidance in the specification, the unpredictability in the art with respect to production of functional foreign proteins in transgenic plants, the limited working examples, the claimed invention is not enabled (throughout the scope of the claims).

See *Amgen Inc. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ 2d 1016 at 1027 (Fed. Cir. 1991) where the court held that the disclosure of a few gene sequences did not enable claims broadly drawn to any analog thereof.

Written Description

6. Claims 1-26 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are drawn to a transgenic plant comprising a nucleotide encoding laccase of any source, including those from fungi and nucleotide sequences having at least 68%-100% and 80% to 100% sequence identity to SEQ ID NO: 1 or sequences that hybridize thereto under stringent conditions, and operably linked to a promoter which directs expression of laccase and at levels of about .01%, 0.1%, 1% and 10% or higher of the total soluble protein of the plant. The claims are also drawn to a method of producing laccase in commercial quantities by introducing a construct comprising a nucleotide sequence encoding laccase, nucleotide sequences having at least 68% to 100% and 80% to 100% sequence identity to SEQ ID NO: 1, the globulin promoter, a signal sequence and target sequence directing the expression of laccase into the plant cell, ER and to the seed of the plant.

The claimed invention does not meet the current written description requirements for the following reasons. Firstly, Applicant has not described consensus sequence or structural element common to all laccase which is substantial portion and which would

allow one to predictably determine what will be the identity (structure) of the laccase DNA from other natural sources. Secondly, since the specification only describes SEQ ID NO: 1 from a single fungal species, genus/species written description requirements are not satisfied. Thirdly, Applicant has not described plant expression vectors which would allow the production levels of at least 1%, 10% and higher of laccase. Fourthly, nucleotide sequences that hybridize to SEQ ID NO: 1 under stringent (low) conditions may not encode laccase, because of the low stringent conditions. Since Applicant has not described the laccase encoding DNA as broadly claimed, transgenic plants expressing said DNA and method for using said DNA to produce laccase are not adequately described. Therefore, the specification fails to sufficiently describe the claimed invention in such full, clear, concise, and exact terms that one skilled in the art would recognize that Applicants are in possession of the invention as broadly claimed.

The Federal Circuit court stated that a written description of an invention "requires a precise definition, such as by structure, formula [or} chemical name, of the claimed subject matter sufficient to distinguish it from other material". *University of California v. Eli Lilly and Co.*, 43 USPQ2d 1398 (Fed. Cir. 1997). The court also stated "naming a type of material generally known to exist, in the absence of knowledge as to what that material consists of is not a description of that material". Id. Further, the court stated that to adequately describe a claimed genus, Applicant must describe a representative number of the species of the claimed genus, and that one of skill in the art should be able to "visualize or recognize the identity of members of the genus". Id.

Weighing all the factors above, the written description requirement is not satisfied. See Written description Examination Guidelines published in Federal Registry/Vol. 66, No.4/Friday, January 5, 2001/Notices).

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 11,13-15 and 24-26 are rejected under 35 U.S.C. 102(a) as being anticipated by Bloksberg et al (WO 98/11205).

The claims are drawn to a transgenic plant comprising any nucleotide sequence encoding laccase, including a nucleic acid sequence that hybridizes to SEQ ID NO:1 under stringent conditions, linked to a promoter that directs expression of laccase, wherein laccase is produced at levels of .01%, 0.1%, 1%, and 10%, and a method for producing laccase in plants in commercial quantities.

Bloksberg et al teach tobacco plants transformed with DNA sequences encoding laccase (LAC) under the control of a promoter, wherein the expressed laccase affected lignin biosynthesis in the transformed plant. The cited reference suggests transformation of corn with laccase gene to modify lignin content. The cited reference does not recite expression levels of laccase (0.01%, 0.1%, 1% and 10% or higher) of the total soluble protein. However, since the laccase is expressed to levels that affected

lignin biosynthesis of the plants, and since the LAC gene promoter used by Bloksberg and Applicant's globulin promoter are comparable in strength, production levels of 0.01%, 0.1%, 1% and 10% are expected to have been achieved in prior art plants and hence the prior art plants overexpressing laccase.

8. Claims 1-5, 11, 13-15 and 24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Faye et al (WO 97/45549). (Abstract and figures were relied upon)

The claims are drawn to a transgenic plant comprising any nucleotide sequence encoding laccase, including a nucleic acid sequence that hybridizes to SEQ ID NO:1 under stringent conditions, linked to a promoter that directs expression of laccase, wherein laccase is produced at levels of .01%, 0.1%, 1%, and 10%, and a method for producing laccase in plants in commercial quantities.

Faye et al teach transformation of plants with DNA sequences encoding laccase (LAC) under the control of a plant promoter for lignin modification. The reference suggests transformation of corn with laccase gene to improve forage quality and the methods are known in the prior art. The cited reference further suggests determining levels of laccase in the transformed plant and methods are known in the prior art. The cited reference does not recite expression levels of laccase (0.01%, 0.1%, 1% and 10% or higher). However, since the laccase has to be expressed to levels that affect lignin biosynthesis, and since the promoters (nopaline synthase and the CaMv 35S promoters with enhancers) used by Faye are comparable in strength to Applicant's globulin promoter, production levels of 0.01%, 0.1%, 1% and 10% are expected to have been achieved in prior art plants and hence the prior art plants overexpressing laccase.

Claim Rej ctions - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-11, 13-18, 20 -26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rodriguez (US 5, 693, 506, filed November 1993, Applicant's IDS) in view of Ong et al (Gene, vol. 196, pp.113-119, 1997, Applicants' IDS).

The claims are drawn to a transgenic plant, including corn, comprising a nucleotide sequence encoding laccase, including those from Trametes versicolor and nucleotide sequences having at least 68%-100% and 80% to 100% sequence identity to SEQ ID NO: 1 or sequences that hybridize thereto under stringent conditions, a promoter which directs expression of laccase, wherein laccase is produced at levels of about .01%, 0.1%, 1% and 10% or higher of the total soluble protein of the plant. The

claims are also drawn to a method of producing laccase in commercial quantities by introducing a construct comprising a nucleotide sequence encoding laccase, including nucleotide sequences having at least 68% to 100% and 80% to 100% sequence identity to SEQ ID NO: 1 under the control of a promoter, a signal sequence and target sequence directing the expression of laccase into the plant cell, ER and to the seed of the plant.

Rodriguez teaches production of heterologous proteins in monocot plants and plant parts, and transformed rice plants and seeds expressing heterologous proteins. The cited reference teaches that plants especially cereals including corn are excellent alternatives for the existing methods (prokaryotic expression systems) for the production of heterologous proteins, because plants have the ability to synthesize target proteins in storage organs such seeds, and in larger quantities. Rodriquez teaches the importance of selection of promoters and signal sequences (including the barley alpha amylase) to achieve efficient expression and secretion of the target protein in plant parts. While Rodriquez does not explicitly teach production of laccase in corn plants, Rodriquez suggests transformation of corn with target genes especially those associated with large volume products such as the fungal laccases.

Rodriguez does not teach laccase-encoding gene from *Trametes versicolor.*

Ong et al teach isolated laccase-encoding DNA from the *Trametes versicolor.* Ong further teach that the laccase-encoding gene of the *Trametes versicolor* is associated with large volume products, widely available and have potential applications in the enzymatic degradation of lignin and paper industry (see Abstract and introduction

of page 113). The laccase gene disclosed by Ong et al, shares 100% sequence identity to Applicant's SEQ ID NO: 1.

Therefore, it would have been obvious to one of ordinary skill in the art to use the method for producing heterologous proteins in monocot plants taught by Rodriguez, and to modify that method by incorporating the fungal laccase gene of *Trametes versicolor* taught by Ong, to produce laccasse in transgenic corn plant/plant parts as suggested by Rodriguez, with reasonable expectation of success. One skilled in the art would have been motivated to use *Trametes versicolor* gene given its large volume product and its availability as taught by Ong et al. Thus, the invention as whole was a *prima facie* obvious.

Claims 1-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rodriguez in view of Ong et al as applied to claims 1-11, 13-18, 20 -26 above, and further in view of Applicants' admitted prior art.

The teachings of Rodriguez in view of Ong et al have been discussed *supra.*

While Rodriguez in view of Ong et al teach the inclusion of tissue-specific promoter in the DNA construct, Rodriguez in view of Ong et al do not specifically teach a globulin promoter. However, the inclusion of a heterologous globulin promoter in plant transformation vector was well known in the prior art, as evidenced by Applicant (paragraph bridging pages 9 and 10).

Applicant's admitted prior art indicates that tissue-specific promoters including the globulin promoter were well known and widely used at the time Applicant's invention was filed.

Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to utilize any of the known tissue-specific promoters of the prior art, including the claimed globulin promoter for their availability, in the transformation construct for expressing laccase of Rodriguez in view of Ong et al without any unexpected results. One skilled in the art would have been motivated to generate the claimed invention with a reasonable expectation of success.

Claims 1-11, 13-15 and 20-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bloksberg (WO 98/11205) in view of Ong (Gene, vol. 196, pp.113-119, 1997, Applicants' IDS).

Bloksberg et al teach transformation of tobacco plants with a laccase gene for modification of lignin biosynthesis in the transformed plant, and suggest transformation of corn, as discussed above.

Bloksberg does not teach laccase-encoding gene from *Trametes versicolor.*

Ong et al teach isolated laccase-encoding DNA from the *Trametes versicolor.* Ong further teach that the laccase-encoding gene of the *Trametes versicolor* is associated with large volume products, widely available and have potential applications in the enzymatic degradation of lignin and paper industry (see Abstract and introduction

of page 113). The laccase gene disclosed by Ong et al, shares 100% sequence identity to Applicant's SEQ ID NO: 1.

Therefore, it would have been obvious to one of ordinary skill in the art to use the method for producing heterologous proteins in plants as taught by Rodriguez, and to modify that method by incorporating the fungal laccase gene of *Trametes versicolor* taught by Ong, to produce laccase in transgenic corn plant/plant parts as suggested by Bloksberg, with reasonable expectation of success. One skilled in the art would have been motivated to use *Trametes versicolor* gene given its large volume product and its availability as taught by Ong et al. Thus, the invention as whole was clearly a *prima facie* obvious.

Remarks

No claim is allowed.

Papers related to this application may be submitted to Technology Sector 1 by facsimile transmission. Papers should be faxed to Crystal Mall 1, Art Unit 1638, using fax number (703) 308-4242. All Technology Sector 1 fax machines are available to receive transmission 24 hrs/day, 7 days/wk. Please note that the faxing of such papers must conform with the Notice published in the Official Gazette, 1096 OG 30 (November 15, 1989).

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Medina A. Ibrahim whose telephone number is (703) 306-5822. The Examiner can normally be reached Monday-Thursday from 8:30AM to 5:30PM and every other Friday 9:00AM to 5:00PM.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Dr. Amy Nelson, can be reached at (703) 306-3218.

Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0196.

1/6/03
Mai

Amy Nelson

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